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Introduction

This chapter contains general information about the mixer and its uses as well as detailed specifications for the instrument.

Uses of a Constant Speed Mixer

Cements are a critical element in the drilling, completion, work over, and abandonment of wells. For each application, a cement slurry is designed with specific properties and is given additives that provide predictable slurry density, volume, viscosity, compressive strength, fluid loss, gas migration, and thickening time. The constant speed mixer is typically used to prepare a cement slurry prior to laboratory testing. The typical test methods are listed in API Specification 10 on Oilwell Cements.

Description of the Instrument

The Model 7000 Constant Speed Mixer is used to mix cement slurries at specific speeds and times for laboratory testing. The mixer has a tachometer to indicate the mixing speed and two pre-set speeds that are user adjustable, but are typically set for 4,000 rpm and 12,000 rpm. The unit is equipped with a timer that allows precise mixing times for any combination of mixer speeds. The instrument also has a variable speed option that allows the speed to be varied using a potentiometer on the control panel.

The mixing container is stainless steel with a plastic lid. The mixing blade assembly uses an o-ring seal for greater leak resistance and a
special hardened blade designed to give up to 10 times longer life than conventional unhardened blades.

**Instrument Specifications**

The specifications below apply to all CTE, Inc. constant speed mixers.

**ELECTRICAL**

Input Voltage: 115 VAC or 230 VAC (±10%)
Input Power: 500W
Current: 4.2 A (115 VAC)
          2.1 A (230 VAC)
Input Frequency: 50-60 Hz

**MECHANICAL**

Height: 26.5 in. (67 cm); 40 in (101.6 cm)
Width: 11 in. (28 cm)
Depth: 16 in. (41 cm)
Weight: 21 lb. (9.5 kg); 35 lb. (15.9 kg)

**ENVIRONMENTAL**

Operating Temperature: (32 to 105°F) 0-40°C
Operating Humidity: 0-95% non-condensing

**DRIVE MOTOR**

Drive Motor: 9/16 hp (420 W)
Drive Speed: 2,000-24,000 rpm (variable)

**Installation**

Upon uncrating the instrument, verify that the instrument and any spare parts on the packing have been received and are undamaged. Notify CTE if anything is missing or damaged.

The mixer may be shipped in an unassembled condition for ease of shipment. Assembly requires no tools. Locate the mixer base and
place on a firm level surface. Slide the two aluminum mounting poles into the sleeves on the mixer base. Slide the two holes in the bottom of the electrical cabinet over the mounting poles and into the sleeves in the top of the cabinet. Place the mixer motor on the mixer base. Connect the two cables from the mixer motor to the appropriate receptacles on the bottom of the electrical cabinet. Mixer assembly is now complete.

Electrical connections are made using the three pronged receptacle on the rear of the instrument. An electrical cord is supplied with the instrument, but an appropriate plug for power must be supplied by the user. Please observe the following precautions when making the wiring connections.

- Wiring should be done by a qualified installer in accordance with local electrical codes.
- The instrument should be securely connected to a separate earth ground. The ground wire must be larger in diameter than the supply conductors.
Operation and Calibration

Chapter 2 will discuss in detail the steps required to operate and calibrate the instrument.

The constant speed mixer is very easy to use. To operate the instrument, simply follow the steps listed below.

Operating the Mixer

To mix cement slurry, follow the directions below. Refer to API Specification 10 for more information.

1. Pour the appropriate amount of water into the mixer container.
2. Turn the **POWER** switch to the ON position.
3. Press the **MIX 1** switch until it clicks into position.
4. Place the **FIXED/VARIABLE** switch in the **FIXED** position.
5. Press the **START/RESET** pushbutton to start the motor and begin the timer countdown from 50 seconds.
6. Add the cement to the water during the first 15 seconds while mixing at low speed (typically 4000 rpm).
7. After the cement has been added, place the cover on the mixer container.
8. When the timer reaches 35 seconds, press the **MIX 2** button and mix on high speed (typically 12,000 rpm) for 35 seconds. When the timer reaches zero, the motor will stop automatically.
Adjustment and Calibration

If the MIX 1 or MIX 2 speed values are not within ±100 rpm of the desired speed, it may be necessary to adjust the MIX 1 or MIX 2 values. To adjust the MIX 1 value, follow the steps below.

1. Pry off the small black cap next to the MIX 1 button.

2. Under the cap is a small screw. Turn this screw clockwise to increase the MIX 1 speed and counterclockwise to decrease the MIX 1 speed.

3. Replace the cap when the desired speed is obtained.

To check the accuracy of the mixer speed, a non-contacting tachometer capable of measuring speeds in excess of 12,000 rpm must be used.

Adjustment of Speed Sensor Gap

Check the gap between the speed sensor and the motor shaft sprocket on the bottom on the mixer base. If the sensor is too close or too far from the sprocket, it makes speed control difficult. It is typical to start with a gap thickness similar to a business card (.25-.30 mm) and adjust it from there. If there is trouble on the high speeds, try increasing the gap a small amount. This may be similar to a trial and error procedure. If the sensor is moved out too far, it may control OK at high speeds but not at the low speeds. The opposite will occur if the gap is too small.
Parts List

This chapter contains a parts list of commonly used replacement parts.

Mixers can be relatively reliable and trouble free—provided they are serviced and maintained properly. Instruments that are neglected and receive infrequent service or are subject to abuse are certain to cause trouble.

The following is a table of frequently used replacement parts along with the CTE part numbers.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
<th>Item Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Stud</td>
<td>C-0333</td>
<td>48</td>
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<tr>
<td>Slinger</td>
<td>C-0612</td>
<td>50</td>
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<td>Cap Nut</td>
<td>C-0609</td>
<td>3</td>
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<tr>
<td>Blade, Hardened</td>
<td>C-0095</td>
<td>4</td>
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<tr>
<td>Bearing Cap</td>
<td>7-0012</td>
<td>5</td>
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<tr>
<td>Washer</td>
<td>C-0334</td>
<td>6</td>
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<tr>
<td>Bearing Holder</td>
<td>7-0011</td>
<td>7</td>
</tr>
<tr>
<td>Washer (SST)</td>
<td>C-0613</td>
<td>9</td>
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<tr>
<td>Washer (rubber)</td>
<td>C-0331</td>
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<tr>
<td>Washer (plastic)</td>
<td>C-0611</td>
<td>11</td>
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<tr>
<td>Shaft</td>
<td>C-0332</td>
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<td>Center Lid</td>
<td>C-0614</td>
<td>15</td>
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<tr>
<td>Container (SST)</td>
<td>C-0615</td>
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<td>Base Gasket</td>
<td>C-0329</td>
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<td>Container Base</td>
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<td>Center Lid</td>
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</table>
### Description | Part Number | Item Number
--- | --- | ---
Outer Lid (vinyl) | C-0618 | 16
Mixing Blade Assembly | 7-0010 | |
O-ring | C-0147 | |
Base | 7-0021 | |
Support Tube | 7-0022 | |
Switch (Power) | C-0075 | |
Switch (Variable/Fixed) | C-0076 | |
Tachometer | C-0152 | |
Switch (Start/Reset) | C-0159 | |
Speed Control Board | C-0162 | |
Power Control Unit | C-0163 | |
Potentiometer | C-0163-1 | |
Motor Brush and Spring Set | C-0298 | |
Lid Assembly (SST) | C-0330 | 501017
Drive Stud Washer | C-0351 | 49
Whole Container Assembly, SST | 07-0009 | CAC33
Timer | C-0164 | |
Washer/Nylon | C-1387 | 8
Hex Nut, Left Hand | C-0673 | 13
Jar Pad | C-1353 | 20
Coupling Assembly | C-1352 | 21

All other Waring parts available. Please call us for pricing.
<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>QTY</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
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<tr>
<td>1</td>
<td>1</td>
<td>7-0011</td>
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<td>C-0332</td>
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<td>3</td>
<td>1</td>
<td>7-0012</td>
<td>Cap</td>
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<td>4</td>
<td>1</td>
<td>C-0334</td>
<td>Washer (Optional)</td>
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<td>5</td>
<td>1</td>
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<td>O-ring</td>
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<tr>
<td>8</td>
<td>1</td>
<td>C-0611</td>
<td>Washer</td>
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</table>

**NOTES:**
1. BEVELED EDGE OF BLADE POINTS DOWN
2. APPLY GREASE TO O-RING C-0147

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**CEMENT TEST EQUIPMENT**

**BLADE ASSEMBLY**

**CUTS**

- 7-0010
- 4-9-98
- 4-9-98
- 4-9-98
- 4-9-98
- 4-9-98
- 4-9-98
- 4-9-98

**MATERIAL**

- CC1

**FINISH**

- 

**APPLICATION**

- 

**DO NOT SCALE DRAWING**

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**SCALE:**

- 1:1

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**审批信息**

- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98
- CCD 4-9-98

**尺寸信息**

- 1/32
- .01
- .005

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**信息**

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